Newton's laws

1. A 2.0-kilogram body is initially traveling at a velocity of 40. meters per second east. If a constant force of 10. newtons due east is applied to the body for 5.0 seconds, the final speed of the body is

   1) 15 m/s

   2) 25 m/s

   3) 65 m/s

   4) 130 m/s

2. A spring scale reads 20. Newtons as it pulls a 5.0-kilogram mass across a table. What is the magnitude of the force exerted by the mass on the spring scale?

   1) 49 N

   2) 20. N

   3) 5.0 N

   4) 4.0 N

3. A net force of 25 Newtons is applied horizontally to a 10.-kilogram block resting on a table. What is the magnitude of the acceleration of the block?

   1) 0.0 m/s^2

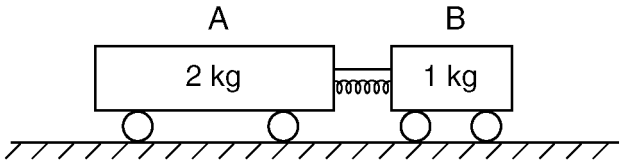
   2) 0.26 m/s^2

   3) 0.40 m/s^2

   4) 2.5 m/s^2

4. Base your answer to the following question on the information and diagram below.

   The diagram shows a compressed spring between two carts initially at rest on a horizontal frictionless surface. Cart *A* has a mass of 2 kilograms and cart *B* has a mass of 1 kilogram. A string holds the carts together.



   What occurs when the string is cut and the carts move apart?

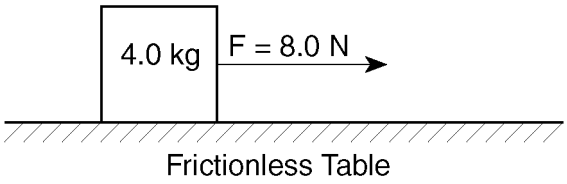
   1) The magnitude of the acceleration of cart *A* is one-half the magnitude of the acceleration of cart *B*.

   2) The length of time that the force acts on cart *A* is twice the length of time the force acts on cart *B*.

   3) The magnitude of the force exerted on cart *A* is one-half the magnitude of the force exerted on cart *B*.

   4) The magnitude of the impulse applied to cart *A* is twice the magnitude of the impulse applied to cart *B*.

5. The diagram below shows a horizontal 8.0-newton force applied to a 4.0-kilogram block on a frictionless table.



   What is the magnitude of the block's acceleration?

   1) 0.50 m/s^2

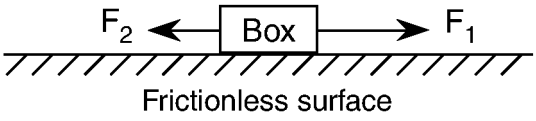
   2) 2.0 m/s^2

   3) 9.8 m/s^2

   4) 32 m/s^2

Newton's laws

6. In the diagram below, a box is on a frictionless horizontal surface with forces F_1 and F_2 acting shown.



If the magnitude of F_1 is greater than the magnitude of F_2, then the box is

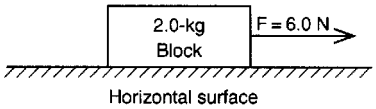
1) moving at constant speed in the direction of F_1

2) moving at constant speed in the direction of F_2

3) accelerating in the direction of F_1

4) accelerating in the direction of F_2

7. The diagram below shows a 2.0-kilogram block being moved across a frictionless horizontal surface by a 6.0-newton horizontal force.



What is the magnitude of the acceleration of the block?

1) 0.33 m/s^2

2) 6.0 m/s^2

3) 3.0 m/s^2

4) 12 m/s^2

8. A 400-newton girl standing on a dock exerts a force of 100 newtons on a 10 000-newton sailboat as she pushes it away from the dock. How much force does the sailboat exert on the girl?

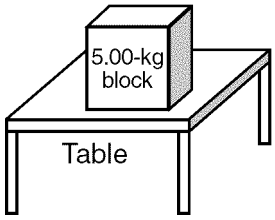
1) 25 N

2) 100 N

3) 400 N

4) 10 000 N

9. The diagram below shows a 5.00-kilogram block at rest on a horizontal, frictionless table.



Which diagram best represents the force exerted on the block by the table?